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## MEDICAL INDUSTRIAL HAZARDS SECTION

J.J. Hickman, Section Chief  
J.E. Rose, Associate Section Chief

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JAN 9 1973

REPORT FOR MONTH OF JANUARY 1946

- |               |            |                     |
|---------------|------------|---------------------|
| 1. R.S.S.     | 7. L.H.H.  | 13. J.E.R.          |
| 2. R.S.S. (I) | 8. J.G.H.  | 14. E.R.R.          |
| 3. L.O.J.     | 9. A.H.D.  | 15. R.E.Z.          |
| 4. J.E.W.     | 10. S.L.W. | 16. G.P.            |
| 5. K.Z.H.     | 11. K.S.C. | 17. J.J.H. (2)      |
| 6. H.J.C.     | 12. S.T.C. | 18. Chi. Tech. File |
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~~SECRET~~

To: Dr. R.S. Stone  
From: Dr. J.J. Nickson  
Subject: Monthly Summary for Section H-III

January 19, 1946

CLASSIFICATION CANCELLED  
DATE 1-27-56  
For The Atomic Energy Commission  
*A. F. Canseel*  
Chief, Declassification Branch *AE*

I. Routine Urine Survey for Plutonium Activity

A. Urine Specimens received

Chicago . . . . .	80
Other . . . . .	10

B. Backlog of specimens

Chicago . . . . .	51
Other . . . . .	28

C. Specimens analyzed

Chicago . . . . .	69
Other . . . . .	38

Of the Chicago specimens analyzed, 7.3 per cent showed a body content of plutonium greater than  $0.1 \mu\text{g}$ , 32 per cent showed negative counts (maximum being less than 0.1 count per minute) and the remainder showed less than  $0.1 \mu\text{g}$  retained in the body.

The laboratory which was designed to be dust-free in order to avoid outside contamination has not met the specifications. However, control urines have been run quite frequently and none have shown counts in excess of 0.1 count per minute per 1000 ml sample.

Special Urines: Two humans were injected with 94.91  $\mu\text{g}$  of plutonium on December 27, 1945. The composition of the injected solution and the volume injected is given in Table I. The urinary plutonium excretion for the male subject is given in Table II and for the female in Table III.

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Table I  
Composition of Solution

Table II

<u>Days after injection</u>	<u>24 hour volume</u>	<u>Specific gravity</u>	<u>Percent of injected dose excreted</u>
1	1130 ml	1.014	0.857
2	1425 ml	1.013	0.152
3	940 ml	1.012	0.063
4	1400 ml	1.012	0.077
5	1160 ml	1.012	0.026
6	1270 ml	1.014	0.0256
7	1290 ml	1.012	0.0234
8	940 ml	1.012	0.0227
9	550 ml	1.012	0.0032
10	535 ml	1.012	0.0097
11	650 ml	1.010	0.0097
12	640 ml	1.010	
13	640 ml	1.010	

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Table I

Daily Plutonium Urinary Excretion (Female-EK-300)

Days after injection	24-hour volume	specific gravity	percent of injected dose excreted
1	1660 ml	1.012	0.152
2	1725 ml	1.010	0.167
3	1750 ml	1.012	0.067
4	1150 ml	1.012	0.033
5	2020 ml	1.010	0.042
6	1300 ml	1.010	0.042
7	1190 ml	1.010	0.0243
8	1500 ml	1.010	0.0254
9	1400 ml	1.010	0.019
10	1280 ml	1.010	0.030
11	1120 ml	1.010	0.019
12	940 ml	1.010	0.014
13	375 ml	1.010	
14	630 ml	1.010	
15	830 ml	1.010	

Plutonium Therapy: Studies are being completed on the effect of pH and citric acid concentration on the diffusibility of Pu(IV) through cellophane membranes using low pressure ultrafiltration techniques. A report summarizing the results obtained in preliminary studies of Pu therapy is being prepared.

Results of ultrafiltration to date show that a pH of about 2.5 immediately precedes a steep drop in the extent of Pu(IV) which is diffusible, thus indicating, it is presumed, the onset of definite colloidalinity. At a pH of 7.3 and in the presence of varying amounts of citric acid, it is found that:

- (a) As little as 0.0001 M citric acid appreciably increases the diffusibility of Pu.
- (b) A minimum in the diffusability of Pu occurs at .005 - .006 M citric acid. This phenomenon, if confirmable, may be